

A Lecture

ON THE

PSYCHOLOGY OF COURAGE.

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THERE are very real and proper reasons for hesitating to talk of courage to an assembly such as this, and the first is that in the good old days, not so long ago perhaps, both the lecture and the lecturer would have been officially banned. It would have been tacitly assumed that courage was inherent in every soldier because he was a soldier, and that under no imaginable circumstances could any soldier lack this quality. It would have been realised that any inquiry into courage must inevitably involve an inquiry into fear, a most reprehensible and dangerous subject for discussion in a school of military instruction. Moreover, seeing that courage is part of the official equipment of every soldier, that it rains upon him as manna rained upon the Israelites in the Wilderness, what possible benefit could accrue from an analysis of this heaven-sent virtue, even supposing that any analysis was possible?

Secondly, one instinctively hesitates to trespass on ground which has been consecrated, and that so recently, by so many great deeds and immortalised by some of the greatest writings in history. But it is as little my intention as it is within my power to declaim the virtues of courage or indulge in panegyrics. My object is quite other than that, and instead of eulogising the manifestations of courage I shall attempt to investigate its origin and purpose, together with the factors which modify it in one direction or another, not forgetting that this quality is not wholly confined to man, still less to the male sex, and that in man, in whom it reaches its highest pinnacle, there is the courage we call moral no less conspicuous and no less instructive than the courage we call physical.

My third ground for hesitation centres round the word psychology, a subject which has occupied the public stage very considerably of late and that, too, in a not very attractive way. The advance of science has always been along the path of hard work, and its progress has never yet been assisted by public parade or advertisement, factors which more often than not have tended to bring the thing studied into confusion, or even disrepute. We have evidence of this in the pseudo-scientific craving evinced for psychological theories in recent years, and we are now witnesses of the unedifying spectacle of an indiscriminating public flocking from Freud to Mrs. Eddy, from Christ to Coué, with an impartiality that might be refreshing were it not pathetic. We are here to-day, however, to study the psychology of the natural rather than that of the morbid, and seeing that this is a lay assembly I shall be able to dispense with the luxuriant language of modern psycho-pathology and have recourse only to words that we can all understand. You must not expect me to indulge in any metaphysical abstractions, for towards these I feel much as Gibbon did when he alluded to "the science, I should say the language, of metaphysics."

THE MEANING OF PSYCHOLOGY.

What, then, do we mean by psychology? We mean the study of the mind as part of the organism; and just as we cannot study the bodily organism without considering the stages through which it has been evolved, so is it unwise and misleading to study the mind of man apart from his history. Similarly the study of individual behaviour is meaningless and empty unless we also study environment, and the

environment of man is essentially man. In other words, the behaviour of any organism—and courage is nothing more than a quality of mind, however noble, associated with certain lines of behaviour—is conditioned largely by evolutionary factors. The only proper method, therefore, for pursuing the study of the mind is the comparative one, and once we realise that psychology is merely a branch of the larger science of biology we shall feel confident that we are on safe ground. I accordingly approach the psychology of courage from the point of view that "Nature has made up her mind that what cannot defend itself shall not be defended."¹ Now the idea that courage has been acquired along evolutionary lines, and that is the argument I propose to elaborate, might at first sight seem a little cold and forbidding to those who, content to indulge in a purely intellectualistic psychology, prefer to regard this noble quality as the particular and cherished attribute of man alone. But our bodies have been evolved through processes extending over millions of years, and have they lost anything of dignity or beauty in their evolution? Does its embryonic origin and intra-uterine development detract from the wonder of the infant or its beginnings in a seed from that of the flower? On the contrary, knowledge enhances wonder.

Again, just as it is a mistake to investigate the activities of man or of any other animal apart from their histories, so is it unsound to divorce the study of the activities of the mind from those of the body, for between body and mind there is an intimate co-partnership both in health and disease. Mental processes, particularly those associated with affect or emotion, are invariably accompanied by changes in the bodily state. It is not labouring the commonplace to draw attention to this fact; rather is it more correct to say that its universal recognition is responsible for the failure to realise its significance. Thus we blush with shame, cry with sorrow, when afraid we sweat and tremble, and when amused we smile. The stage, and particularly the kinema, actor depends for his success on the skill with which he can reproduce the physical manifestations of the emotions he is supposed to feel. Conversely it is well known that conditions originating within the body effect alterations in consciousness; hunger, for example, is associated with a particular type of contraction of the muscular wall of the stomach, and these contractions are terminated by the ingestion of food. Similarly, pain is accompanied by the inhibition or cessation of the secretion of gastric juice. Arguing on these lines it has even been suggested² that the source of behaviour is to be found in the periphery, or, to put it colloquially, the stimulus which compels the organism to such behaviour as shall satisfy its cravings arises in the organs of the body rather than in the higher nervous centres, while the latter merely serve to coördinate and integrate these various cravings of bodily origin. I mention this somewhat fantastic theory in passing in order to impress upon you the inter-dependence of mind and body.

COURAGE IN LITERATURE.

Proceeding now to examine the subject of courage as it appears in literature, certain features demand our attention.

The first is that courage is applauded for what it is, as an entity, and little if any attempt is made to investigate the elements of which it is compounded or the motives which underlie it. The element of fear, for instance, is either completely ignored or glossed over, and courage is left in splendid isolation, the perfect quality, heaven-sent, and "people forgive everything to it."¹

Secondly, perhaps because it lends itself more readily to treatment, or perhaps because it is more intelligible, the courage of the individual rather than that of the mass takes pride of place in the literature of all ages and nations.

Thirdly, it is interesting to observe that the actual words by which this quality is described have not always had the same meaning.³ This is not the case

with the word "courage," which although used by Chaucer as synonymous with "heart" (from the Latin "cor") as the seat of feeling, rapidly became identified with spirit, liveliness, vigour, and finally with readiness to face danger. With the word "bravery," however, it is different; derived from a French or Spanish source, it originally denoted the action of braving or acting the bravo—i.e., daring, defiance, boasting, swaggering, bravado—while the noun "brave" indicated a bully or hired assassin. Only later did it come to mean courage, valour, fortitude, and even now it sometimes implies show, ostentation, splendour, or finery, as, for example, in a description of a London crowd in the park, "Tens of thousands in all their Sunday bravery." So again the adjective "bold," an old Saxon word, was and still is used to indicate not only the stout-hearted, courageous, and fearless, but also the audacious, presumptuous, the opposite of modest, as in the phrase "a bold young woman," or "bold-face," meaning an impudent person. Bacon used "boldness" as synonymous both with impudence and hot-headedness; "the right use of bold persons," he says, "is that they never command in chief, but be seconds and under the direction of others; for in counsel it is good to see dangers, and in execution not to see them except they be very great."⁴

Fourthly, the most divergent views are current regarding the type of individual who is courageous, and the extremely varied incidence of courage has often been a matter for surprise. During and since the war, for instance, people have busied themselves with such intangible problems as to whether colliers are braver than clerks or artisans than farmers, problems which have proved unexpectedly difficult to solve. Captain John Brown, the hero of Kansas, held the belief that the quiet peaceable man makes the best soldier; "as for the bullying drunkards of which armies are usually made up, he thought cholera, small-pox, and consumption as valuable recruits."¹

"'Tis still observed that men most valiant are
Who are most modest ere they came to War."

On the other hand, we have the opinion of one⁵ who, writing about the recent war, remarks, "One of the things that astonished me most was to find out the types of men who were most brave; the drunkards, the rakes, and the dandies were a long way first. The high-minded, religious people of strong principles were often good diers, but not often good fighters. The orderly, well-disciplined, obedient types were more often than not quite useless in the face of the enemy." He goes on to say how he was discussing the psychology of bravery with Sem, the French caricaturist, and "was telling him how extremely gallant were the dandies and the fops, and he made this wise answer, 'Après tout, le courage—c'est une élégance.'" In the course of this lecture I hope we shall find some means of reconciling such opposite opinions, and shall come to understand that courage is something much more than "une élégance."

DIFFERENT FORMS OF COURAGE.

It is customary to recognise certain forms of courage. First and foremost is the pure and sublime courage, its beauty lauded in prose and sung in verse throughout history, "the endowment of elevated characters,"¹ a virtue regarded with reverence, awe, and envy, the sole prerogative of man. Such courage is eminently attractive from its being effortless and natural. It is characterised by equanimity and outward calm, and neither fear nor anger approach it; it is quiet, unruffled. Its tranquillity contrasts strangely with the power and energy it wields. "The immense esteem in which it is held proves it to be rare."¹ And at that we may leave it, not forgetting that women as well as men have contributed in no small measure to its irresistible appeal—Joan of Arc, Florence Nightingale. Psychologically this form of courage represents the complete success of the process by which fear is kept out of consciousness; this process, which is wholly unconscious, is called suppression.

Secondly, there is courage in spite of the presence of fear. Unlike "sublime courage" this form has received but scant attention in literature, and yet most of us would allow it to be one of our commonest modes of reaction to danger. The almost pointed way in which fear is ignored by the essayist suggests a disinclination to face facts which appear unpalatable and reflects a habit of mind both of writer and reader which prefers to arrive at comfortable conclusions rather than the truth. This method of dealing with unwelcome experience by professing to ignore it is, I believe, far less general than it used to be, and people nowadays are inclined to think with more honesty and less pretence. This advance has been greatly facilitated by the war, and especially is this the case with our views concerning courage. It is true that no one quite likes to admit feeling afraid, and such slang expressions as "wind up," "cold feet," and "needle," which enable us to talk freely about fear without actually naming it, are evidence of this natural disinclination. It was recently my privilege to listen to the evidence given by many eminently brave men before the War Office Committee on (so-called) Shell Shock; they all knew what fear was, and few of us would hesitate to admit in the words of one of them, and incidentally, one of you, that "All men know fear; some conceal it better than others, a few bury it out of sight, but it is there all the same."⁶

"If you can force your heart and nerve and sinew
To serve your turn long after they are gone,
And so hold on when there is nothing in you
Except the Will which says to them: 'Hold on!'"⁷

The second form of courage occurs, then, in the presence of fear, but fear is repressed sufficiently to allow of the dangerous situation being adequately dealt with; the process of repression is, however, not unconscious, as in the first type of courage, but conscious, sometimes acutely conscious.⁸

A third aspect of courage is recognised—namely, courage for the sake of display or notoriety, and it is in connexion with this form of courage in particular that the various meanings of the words "boldness" and "bravery" have their chief interest. From the psychological point of view this aspect of courage is of the greatest importance, for it implies that the individual is prepared to dare dangers in order to secure some advantage pleasing to himself. Now assuming that in the majority of individuals the presence of danger is normally associated with the presence of fear of some degree, we have here to deal with a case in which the emotion of fear is masked or actually replaced by another emotion—namely, the pleasurable emotion associated with personal advancement, gain, or success, which the individual anticipates. Now a much commoner mode of reaction to danger, both in animals and man, is by aggression, in which the emotion of fear is replaced by the emotion of anger; we "see red." Accordingly, I propose to call this third form of courage, whether it be the courage of anger or the courage of display, the "courage of substitution." It illustrates the complexity of the mechanisms at man's disposal, whereby threatening situations may be met, and, further, it constitutes a means whereby, when the danger is not averted, its consequences—namely, physical or mental pain—may be mitigated or completely suppressed by the substitution of some emotional state of great intensity. For example, a hack on the shin at football is often not felt until the game is over. Similarly, fervour, enthusiasm for a cause, especially religious enthusiasm, have inspired some of the most famous acts of courageous devotion, such as that of "the poor Puritan, Antony Parsons, who at the stake tied straw on his head when the fire approached him, and said 'This is God's hat.'"¹

The last form of courage which is generally recognised is what one may call negative courage, or, if you prefer it, the courage of ignorance. Here it is implied that fear is absent, not because it has been consciously or unconsciously suppressed, nor because it has been replaced by some other emotion, but

simply owing to the fact that the emotional capacity of the individual is much below normal or even absent. A lunatic, for instance, may perform acts of prodigious valour, but they are merely the acts of lunacy, devoid of affective tone. Similarly it is well known that the unimaginative individual is often the most brave, because he is incapable of appreciating the probable consequences of his actions. Closely allied to this is "Dutch courage," where the higher nervous centres are dulled by the action of alcohol, and perception and judgment are grossly interfered with.

THE OBJECTIVE METHOD OF INQUIRY.

Such is my attempt to sketch the lines along which courage has been studied by the lay writer. We must now turn aside and follow another path—namely, the psychological one—and see in what direction it leads us. At the outset of any psychological inquiries the layman may quite properly and justifiably adopt a critical attitude and demand to know what *method* it is proposed to use. He will have no difficulty in understanding that A can investigate the *bodily* organs of B and study their behaviour both in health and disease, but an inquiry into the *mental* activities of B is quite another matter, seeing that its success largely depends on B's acquiescence in the inquiry. Or B may be willing to acquiesce in A's investigations, but A's methods of approach and his interpretations of B's mental activities may be unconsciously prejudiced by certain views entertained by A which are very dear to him. Thus crudely expressed we have the essence of the difficulty which surrounds all psychological inquiry. For thousands of years man has been interested in the study of his own mind, and has adopted for that purpose the obvious or common-sense method of introspection. The fact that this academic or intellectualistic psychology has been largely barren of results is attributable to fallacies inherent to the method, for it does not tell us what man is, but what he thinks and feels and likes himself to be.⁹ This method was therefore discarded in favour of a more *objective* method of inquiry, which concerned itself particularly with behaviour—that is to say, with what the organism was doing. More recently the behaviourist school has been reinforced and finally replaced by another which, no longer content to ask "What is the organism doing?" insists on prosecuting the almost impertinent question "Why is the organism doing it? Why doing this and not doing that?"¹⁰ The founder of this school is Freud, whose persistence in the pursuit of truth has evoked the admiration even of those who most differ from him. Now since Freud is a name which probably has for most of this assembly a significance which differs from that which it has for me, a few words of explanation are indicated. Freud's investigations, originally confined to abnormal mental conditions, led him to the view that the root of the abnormality lay in a struggle between two forces—namely, the instinctive impulses and the repressive forces. The idea of mental conflict is the basis of all Freudian psychology. As the result of this conflict experience based on instinctive impulses, or rather on impulses associated with the primitive instincts, unless converted into other channels, frequently comes to be buried or repressed owing to its incompatibility with social standards, and Freud postulated a new region of the mind, termed "the unconscious," which serves as a sort of reservoir for all experience thus repressed. By the term "the unconscious" we denote all experience which cannot be brought into the field of consciousness by any of the *ordinary* methods of memory or association.⁸ Further, the content of the unconscious is essentially affective or emotional in character, and although buried, it continues to exert an influence on the conscious. The content of the unconscious can, however, be brought into the field of consciousness under certain conditions—namely, in dreams, in hypnotic states, and by Freud's particular method of free-association or psycho-analysis. It is well known that Freud, as a result of his investigations, was led to the conclusion that the great bulk of repressed experience

was connected with the sexual instinct. This conclusion has failed to find anything like universal acceptance, but Freud's claim to fame does not rest on his interpretations, but rather on the new conceptions which he has advanced concerning the *mechanisms* of mental activities, as I have briefly sketched them. These conceptions will in all likelihood share one day the fate of many other theories, but for the present they provide a consistent working hypothesis which has already stimulated psychological inquiry to a quite remarkable degree. For these reasons it is preferable to make use of them, rather than reject them because in certain hands they "have sometimes led to the discovery of unpleasant aspects of human nature or because they come from Vienna."⁸

THE COMPARATIVE OR BIOLOGICAL METHOD.

The Freudian psychology is, however, open to one important criticism, especially when it is applied, as its adherents are now applying it, to normal behaviour, and the criticism is that its point of view is essentially human and ignores biological considerations. It recognises the evolution of the adult from the child, but is silent concerning the evolution of the species. The comparative or biological method is naturally free from this objection, and is the one along which I particularly wish to direct your thoughts to-day. While free to make use of the mechanisms of mental processes as enunciated by Freud, its outlook is far wider and embraces the whole range of animal life. In its study of man the comparative method adopts the point of view that man as a solitary animal is unknown, that he is not completely free to act as his individual fancy dictates, but is subject to certain instinctive influences, some of them common to all animals and to others that are not.

As you are doubtless aware, it is not always easy satisfactorily to differentiate between instinct and intelligence. Instinct is innate and independent of experience, whereas intelligence is acquired in the light of experience. But in any intelligent behaviour it is often difficult to exclude innate factors, while conversely it is difficult, especially in those animals, such as man, which are born in a state of great immaturity, to exclude individual experience however instinctive their behaviour may appear to be. The instincts common to all animals, or primitive instincts, are two in number.⁸ First is the instinct of self-preservation, which can be subdivided into (a) the purely appetitive instincts underlying nutrition with their corresponding affective states of hunger and thirst, attraction towards the useful and repulsion towards the harmful, and (b) the danger instincts, with their various modes of reaction such as flight and aggression. The second is the reproductive instinct, again divisible into (a) the purely appetitive, and (b) the parental instinct; with this we are not concerned to-day.

Now it is important to observe that all instinctive reactions are accompanied by *feeling*, in such a way that the emotions may be regarded as the affective aspect of instinctive reactions. For example, the primary states of pleasure and pain are the psychological accompaniments of the fundamental reactions of attraction towards the useful and repulsion towards the harmful. Similarly the reproductive instinct is associated with the emotion of love and passion, and in its parental aspect with the tender emotion, especially that of the mother towards her young. Again, in respect of the instinct of self-preservation we find the emotion of fear associated with reaction to danger by flight and the emotion of anger with reaction to danger by aggression. These emotions, moreover, are exceptionally powerful, as evidenced by the conduct of the animal when completely under their influence and by the gross physical alterations which they effect. The common phrases "half dead with fear" and "beside oneself with anger" bear ready witness to these facts. From the biological point of view we are justified in regarding these emotional states as being purposive, in so far as they tend to reinforce the instinctive reaction. Thus not only does the tiger,

when cornered, fight with greater vigour because he is angry, but, in addition, the physical changes associated with anger, by increasing the blood-supply to the brain and muscles, render him more efficient. Correspondingly in those animals whose normal reaction to danger is by flight, fear reinforces the instinct and renders their flight prompt and successful. The same is, of course, true of the sexual instinct, as evidenced by the ferocity and restless activity of the male in the breeding season, and by the vigour, I had almost said courage, displayed by the mother in defence of her young.

THE GREGARIOUS INSTINCT.

In addition to the two primitive instincts we can recognise a third instinct—namely, the social instinct, through the agency of which cohesion is maintained in the herd, or group, or society. This is often called the gregarious instinct, under the influence of which the individual members of the group unite in common action for furthering the welfare of the group.[†] Three types of gregariousness can be identified, the aggressive as exemplified by the wolf pack, the defensive as exemplified by the sheep, and the socialised as exemplified by such varied species as the worker bee, the penguin, and man. Gregariousness, then, is not a modern or superficial condition, but a very old and fundamental one, and has certain distinguishing features. The first of these is the preference shown for companionship and the feeling of comfort and security derived therefrom. The second feature is the homogeneity of the herd or group; this is attributable to the suggestibility of its component members and to their specific sensitiveness to suggestions which come from the herd. The obvious effect of these conditions is to ensure that each individual shall conform to the behaviour of his fellows and shall show preference for herd opinions as opposed to any others. They are evidently not the conditions to encourage originality. The sensitiveness of the herd is well seen in the sheep in the rapid but silent manner in which the approach of danger is communicated to the flock. Now the sheep is a timid animal that reacts to danger by flight, and its timidity, together with the sensitiveness of its individual members which allows of the rapid communication within the herd of the approach of danger, represents a mechanism for defence. Similar suggestibility and sensitiveness are manifested in aggressive societies such as that of the wolf and dog by the howling of the pack and “the cry of the hounds.” Thirdly, the gregarious animal is susceptible to leadership, provided that the leadership is for the good of the herd as judged by herd opinion. In other words, there is a submissiveness of the individual within the herd and a resistiveness of the herd itself to individuality. Fourthly, in all gregarious animals we have to recognise the existence of what has been called herd impulse, by which is denoted a force which is capable of endowing outside influences with the energy of instinct and of conferring instinctive sanction both to beliefs and action. This surely is the idea underlying Montaigne’s aphorism: “Custom is a second nature and no less powerful.” The primitive instincts, then, of self-preservation and reproduction control from within and the herd instinct from without, and in the latter we can already identify the germs of what we call public opinion. It will further be evident that the gregarious instinct must at times be opposed to the more primitive instincts and so introduces a factor which promotes mental conflict. In many respects, however, it reinforces the primitive instincts and facilitates the performance of their reactions.

Man differs from the infra-human animals not in being devoid of instinctive feeling, but in having a larger intelligence which permits him to respond in so great a variety of ways that the instinctive character of his actions is often not obvious in his behaviour. He has further acquired the capacity to divert the energy arising from instinctive impulses

into other channels, artistic, æsthetic, athletic, and so on, and has developed within the herd an individuality which tends to increase with every advance of his civilisation. In spite, however, of his greater individuality and increasing freedom within the herd, it remains a mistake to regard man as fundamentally independent of his biological history, however pleasant this view may be to the intellectualist; and seeing that man’s personality is incomplete apart from the herd, it follows that human psychology must always be the psychology of associated man, for man as a solitary animal is unknown.

THE INFLUENCE OF HERD INSTINCT ON HUMAN BEHAVIOUR.

The evidence that man is gregarious is overwhelming, and the influence exerted by herd instinct on human behaviour is manifested in many directions. His intolerance of solitude, for example, both physical and mental, is seen in his desire for companionship and is reflected in the proverb “Out of sight, out of mind.” It is further responsible for his hesitation in advancing new opinions, for the chilly reception which he accords them, and for his reserved and somewhat belated recognition of the courage displayed by those who insist on maintaining them. His relations with his fellows are dependent upon their recognition of him as a member of the herd, and the formalities subserving mutual recognition are correspondingly important while the strictest observance is enjoined in their performance. These formalities, moreover, whether it is the hand-shake, the raising of the hat, or the salute, are comparable to those employed by other gregarious animals such as the dog, however much the intellectualist may strive to confuse their identity. It would even appear that speech was primarily introduced to subserve mutual recognition rather than exchange of ideas, and it is noteworthy that ordinary conversation is largely confined to subjects of common interest to the herd, such as the weather, or the morning news which everybody has read. Another prominent feature of man’s gregariousness is his suggestibility and his greater sensitiveness to the voice of the herd than to any other influence. Feeling is dominated by herd opinion, and reason cannot enforce belief against herd suggestion; experience before it is accepted must meet with herd approval, and this again leads to delay and hesitation in acceptance. Consequently we find that settled opinions, many of them irrational, are characteristic of the societies, classes, and cliques of which the modern herd is composed, but the force with which such opinions are endowed by herd impulse more than compensates for their irrationalism and for the slender knowledge on which they are based. We derive much comfort from certitude, and are easily deceived by custom. The truth of these statements is obvious when we realise the enormous import of the expression “bad form,” and our irresistible tendency to “lay down the law” and express confident opinions on subjects concerning which our ignorance may be complete. There is a wealth of meaning in the Gilbertian lyric—

“Every boy and every girl that’s born into the world alive
Is either a little Liberal or else a little Conservative.”¹¹

It is owing to somewhat similar considerations that the most satisfied members of the herd are often the most dull, for they attain mental certitude and comfort by implicit obedience to the voice of the herd and by an indifference to experience amounting almost to hostility. In this class are to be found the more reactionary elements, who nevertheless take pains to invite compassion by the use of some such idealistic title as “Die Hards.” Compare, too, the readiness with which the herd entrusts authority to the orthodox and the old, to those in fact who, timid of novelty and shunning the enthusiasms of youth, “do nothing in particular, and do it very well.”¹² “Men of age object too much, consult too long, adventure too little, repent too soon, and seldom drive business home to the full period, but content themselves with a mediocrity of success.”¹²

[†] In the following pages the views elaborated by Trotter have been closely and often literally followed. (Vide ref. 9.)

THE UNCONVENTIONAL TYPE.

But besides the "stable," or resistive class, with its orderly, stereotyped habit of mind, there is to be found in modern society, and in ever-increasing numbers, a diametrically opposite one, whose energy, enthusiasm, unorthodoxy, and instability are derived largely from their incapacity to assimilate unwelcome experience by the simple process of false rationalisation and indifference. Moreover, it is on the presence in the herd of the unconventional that progress largely depends, and an illuminating feature of the war and post-war period has been the increasing tolerance manifested by the community to the activities of what in the broadest possible sense may be called the unstable. In the past these individuals, pioneers and extremists, have paid the heaviest penalties for their preference for originality and ideals rather than for herd opinion, and have faced with dauntless heroism the dungeon, the rack, the scaffold, and the stake. With their larger perspective so often opposed to the more limited outlook of the herd, they lack the mental comfort which characterises the "stable," and their capacity for brilliance of conception and boldness of execution is seriously handicapped by their erratic disposition and greater proneness to fatigue. Any discussion on courage must be incomplete unless attention is drawn to these facts, for during the war we were witnesses of the spectacle of individuals of the most varied temperaments and upbringing being brought into an atmosphere wholly foreign to their natures, and displaying evidences of courage and endurance at a cost to themselves which it was often difficult to understand and almost impossible to estimate.

Further evidence of the gregariousness of man is to be found in his increased susceptibility to leadership in war—i.e., when the whole herd is threatened; the tremendous influence exerted by Lord Kitchener provides a recent example of this. It would also appear that the wide and traditional acceptance of the analogy so often drawn between Christ and His Church and a shepherd and his flock bears testimony to the same characteristic of human society.

PUBLIC OPINION.

These various evidences of gregariousness in man may appear to have little to do with the subject of this lecture. Attention is directed to them, however, in order to emphasise the enormous importance of herd instinct in the influence which it has exerted throughout the whole history of man, and is exerting at the present time. I now pass on to consider another element of gregariousness to which brief allusion has already been made under the name of public opinion. We have learnt enough of herd instinct to realise without further elaboration that the origin of our moral codes is to be found in herd opinion. In the rites and solemn ceremonies of primitive man we can detect the germs of modern conventions, sanctions, and laws, and the energy imported to these by herd impulse explains the almost unlimited power which lies behind them. Moreover, seeing that in gregarious animals below man the welfare of the individual is subordinated to that of the herd, it is impossible to avoid the conclusion that altruism is a product of the gregarious habit, and must therefore be regarded as being just as natural as any other instinct.¹³ It has been computed, for example, that the average worker bee, deaf to all voices other than that of the hive, works herself to death in about two months; she does it, moreover, with exuberant energy and every appearance of joyfulness, a little fire ablaze with altruistic feeling and unselfish enthusiasm.⁹ Again, the dog, accustomed originally to obey the voice of the pack and now subservient to a human master, will spontaneously return to his master to receive the punishment he knows he has merited with every appearance of guilt. Herd instinct, in fact, introduces a mechanism by which the sanctions of instinct are conferred upon acts by no means acceptable to the body or mind, a mechanism in which originates the sense of duty, conflicting often with the more primitive instincts of

self-preservation and reproduction. According to this argument, it is a mistake to regard man as an intrusion into the world, fundamentally independent, splendidly isolated, divorced from history, responsible to himself alone; on the contrary, it is far more rational to regard not only the bad but also the good elements of man's behaviour as products in no small measure of his development. However complex his behaviour, however obscure his motives, man is sensitive to the call of duty, of love, and of honour, altruistic, generous, and courageous not because reason recommends it, but because he must be.⁹

MECHANISMS TO ENSURE SAFETY.

Let us pause for a moment and take stock of the views we have attempted to formulate. It has been pointed out that the psychology of man is largely determined by his biological history, and that his conduct, being largely instinctive, is open to generalisation to a far greater extent than is sometimes supposed. In addition to the primitive instincts, man, like many other animals, is subject to herd instinct, modifying, and often conflicting with, the former, while both frequently conflict with experience. It has further been emphasised that the instincts are associated with various emotional states which serve to enhance interest and facilitate the successful accomplishment of instinctive reactions. We have seen, also, that altruism is an essential product of the gregarious instinct and that in the energy derived from herd opinion we can identify the germs of the moral codes by which human society is governed and controlled. Seeing, therefore, that the welfare of the herd predominates, it is not surprising that mechanisms have been evolved to ensure its safety. One such mechanism, I submit, is courage, which though called by that name only where man is concerned is not wholly unrepresented in animals. Owing to his greater intelligence and broader outlook, man can not only respond to any threatening situation in a variety of ways, but also has a far greater variety of threatening situations to respond to. Consequently the scope for the display of courageous qualities is enormously increased in man, so that we recognise beside physical courage, the courage we call moral, manifested in the field of art, of politics, of religion, and commerce. Moreover, owing to the greater individuality of man, entailing wide differences in adaptation, it happens that our mode of response to the same set of circumstances is subject to wide individual variations. So, too, there is a curious specificity about courage, as seen from the fact that a woman may present a bold front to a burglar and flee in terror from a mouse. "There is a courage of the Cabinet as well as a courage of the field; a courage which enables one man to speak masterly to a hostile company, whilst another who can easily face a cannon's mouth dare not open his own."¹

"PURE" COURAGE.

If now we review the forms of courage previously alluded to in the light of what has been learnt, it is easy to understand that "pure" courage represents the perfection of the psychological processes which have as their object the successful response to danger. Here fear, the presence of which in anything like an acute form would inevitably interfere with the response, is completely suppressed by a process which is wholly unconscious, and the individual, or unit, is free to deal with the situation calmly and unperturbed. It has recently been suggested⁸ that man's normal mode of reaction to danger is by manipulative activity, and that if his freedom of action is interfered with fear tends to obtrude into consciousness. This view finds support in the universal experience that trench warfare against an unseen enemy is infinitely more trying than a war of movement. Another form of courage is that in which the emotion of fear is replaced by some other affective state, of which anger is the most common, but by no means the only one. This form of courage admirably illustrates the complexity of man's behaviour, for the emotional forces which underlie it may be of the most varied kinds, such as

love of notoriety, covetousness, personal pride, religious enthusiasm, and so on. This aspect of courage in a recent article in the *Times* has been quite inappropriately termed the "courage of ignorance." In contrast with these two forms of courage which we may call the courage of fearlessness, there is the courage despite the presence of fear, or the courage of fearfulness. Here the enormous power wielded by herd opinion, in the shape of an *instinctive* sense of duty, comes into play, and ensures that the unit, be it XI. or XV., regiment or squadron, class, or nation, shall not be jeopardised by the frailty of its individual components. Was there not once a Spartan boy, who to escape the disgrace of being branded a thief permitted the fox which he had stolen and concealed under his tunic to gnaw into his entrails? "I can well die but I cannot afford to misbehave."¹

COURAGE AND MENTAL HEALTH.

Human courage, then, in all its forms, may be regarded as a defence-mechanism of great complexity and great efficiency, and the universal esteem in which it is held, by conferring upon it the force and energy of herd instinct, adds enormously to its usefulness to the community. The efficiency of this mechanism is subject to the rules which modify mental health in general, for courage may be properly regarded as evidence of the existence of mental health. Now health of mind depends on the presence of a state of equilibrium between instinctive tendencies and the forces by which they are controlled. Weakening of the latter from whatever cause leads to the development of various abnormal states, the character of which largely depends on the particular "make-up" of the individual affected. The most frequent cause of weakening of the controlling forces is undoubtedly fatigue, the result of long-continued stress and strain, loss of sleep, exposure, and so on. In the air an additional factor is operative—namely, the defective oxygenation of the blood, and consequently of the brain, which occurs at high altitudes. During the war the conclusion was repeatedly forced upon me that courage and morale tend to evaporate at high altitudes, and I believe it was owing to this that relatively few decisive combats were fought at the greater heights to which your machines could attain. Under conditions of stress the normal controlling mechanisms become weakened, and fear which had hitherto been completely suppressed, gradually obtrudes into consciousness. This at once introduces an element of conflict, since fear, owing to its incompatibility with social standards is regarded with shame, and its further intrusion has to be resisted at all costs. Thus begins the process of *conscious* repression which in many cases is successful in restoring the normal mechanisms. In others, however, and especially when the conditions of stress persist, conscious repression fails in its object, and a state of anxiety, with its attendant physical and mental manifestations, gradually supervenes.⁸ The development of such anxiety states is essentially due to fatigue of the higher controlling mechanisms. Now fatigability is a characteristic of all living things and its natural remedy is rest, and it is important to recognise that alternating periods of activity and rest are merely illustrations of the rhythmicity which pervades all life, as evidenced by the seasons of the year, the ebb and flow of the sea, the beat of the heart, and the states of asleep and awake. "To everything there is a season and a time to every purpose under the heaven; a time to be born and a time to die, a time to break down and a time to build up."¹⁴

THE OBJECT OF MILITARY TRAINING.

The more military applications of these various considerations are obvious from the fact that the essential object of military training is to establish morale and enhance the homogeneity of the herd. This is effected in various ways. Your leaders, generally speaking, have been recruited from a class in which respect for tradition and custom figure prominently: accustomed to rule as lords of the land, they

have been wont to indulge their leisure in vigorous and dangerous sports and pursuits, and to cultivate the spirit of adventure under a strict, if somewhat inelastic, code of class discipline. Drill, again, encourages responsiveness and increases the awareness of each individual of what is passing in the minds of his companions. In addition to the processes of habituation and heightened suggestibility which characterise regimental life and lead to cohesion, morale is further strengthened by the wise and systematic use of sublimation. By this term is denoted the process in which the energy arising out of conflict is diverted from some channel which leads in an asocial or antisocial direction, and turned into one leading to an end connected with the higher ideals of society.⁸ This is the significance of esprit de corps, pride of regiment, belief in a cause, and, in fact, of all those influences by which a soldier is encouraged to set so high a value on his duty towards his comrades that he is ready to die in its execution.

"We would not die in that man's company
That fears his fellowship to die with us."¹⁵

The innumerable manifestations of courage and endurance exhibited during the war were only rendered possible by this spirit of comradeship, and in this and in the use of mass attacks we recognise unmistakable evidences of gregariousness. A further instance of the heightened suggestibility of the well-trained soldier is to be found in the contagiousness of courage; it is "caught as men take diseases one of another"¹⁶; and may rapidly infect a whole army. There are, I think, indications at the present time that those responsible for military training in this country, without in any way losing sight of the inestimable importance of all those factors which make for disciplined cohesion, are more inclined than they have been in the past to pay attention to the psychology of the individual soldier. This question is of particular significance in a force such as yours, where, from the very nature of your duties, individualism must always be more prominent than in other branches of the Service. It is at any rate certain that responsiveness and automatic obedience to orders can be overdone. "The success of the Captain of Koepenick, for example, could only be possible in an army whose members had, through a special course of training, reached such a pitch of responsiveness to the commands of men in uniform that they obeyed without question the ludicrous orders of a cobbler."⁸

CONCLUSION.

In this study of the psychology of courage I have attempted to expose the fallacies inseparable from the purely intellectualistic method, and the limitations imposed by a view which regards courage as the sole prerogative of man. Especially is the wide divergence of opinion as to the type of individual, or class, likely to exhibit courage to be explained by the fact that courage has been too often regarded as an isolated quality of isolated man, while the motives underlying it have been consistently ignored, presumably because they are sometimes unsatisfactory. I would ask you once more not to be misled into thinking that courage loses anything of beauty or nobility because evidences of its existence are to be found in animals lower, much lower, than ourselves. It cannot surely handicap a young soldier to know that the seeds of courage have been sown in him by Nature? We have to be courageous or fail in our struggle for supremacy. For nearly three years of war I was permitted by a fortunate chance and the kind indulgence of my superior officers to be a safe, yet intimate, witness of many of those acts of irreproachable courage which stand to the credit of your Service; so close an insight into the mysteries of courage only served to enhance my admiration and arouse my curiosity. But curiosity as to its nature will never prevent us from idealising courage. Courage, from whatever angle we approach it, whatever origin or purpose we assign to it, no matter what form it assumes, nor even what motives underlie it, will always be a quality beloved of man. The courage of attack, the

courage of defence, the courage of art, the courage of debate, the courage of motherhood, the courage of grief, the courage of adventure, the courage of ill-health, the courage of the martyr, the gambler, and the spy, each for itself we respect and admire. And, after all, "it is not life that matters, but the courage that we bring to it."

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Three Lectures

ON THE

CULTIVATION OF TISSUES AND TUMOURS IN VITRO.

Delivered at University College, London,

By A. H. DREW, D.Sc.,
IMPERIAL CANCER RESEARCH FUND.

LECTURE I.*

(Delivered on Feb. 28th, 1923.)

THE TECHNIQUE OF TISSUE CULTURE.

IN this course of lectures I propose to deal with the cultivation of tissues in media under three separate headings. In this, the first lecture, we shall have to consider the subject from what is perhaps its least interesting aspect—viz., the technique which it is necessary to adopt in order to obtain cultures, and having obtained them to keep them growing continuously in subculture. In the second lecture I propose to deal with the question of the growth of normal tissues in vitro, and in the third and last lecture to discuss the application of the method to cancer research and to consider some of the results obtained from a study of cultures of tumours in different media.

THE PLASMA MEDIUM.

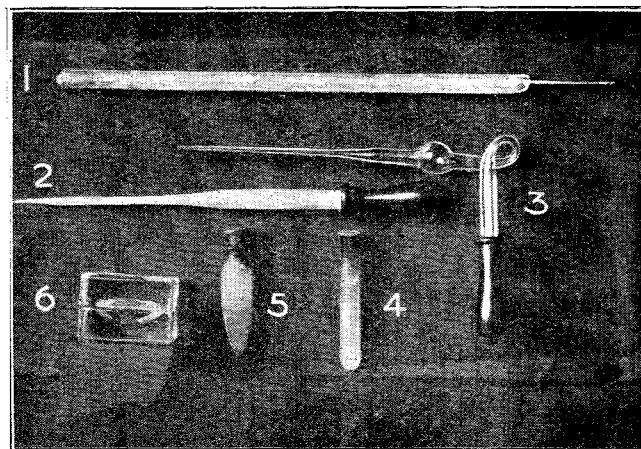
Although in the past many different media have been tried with greater or less success, the only two which have proved to be really successful are a plasma medium and a saline medium recently devised. It will be necessary, therefore, to consider the best methods for obtaining plasma, and the preparation of the saline medium. Although in America chicken plasma has been more used than any other and chicken tissues chiefly studied, I propose to discuss the growth of mammalian plasma. One of the most convenient animals for such a purpose is the rat, which gives a good yield of plasma, in which grow readily not only rat tissues, but those of the mouse, guinea-pig, and rabbit, and doubtless many others.

Rat Plasma.

In order to prepare plasma from such an animal as the rat a number of instruments are required in the following order. Three or four pairs of sterile forceps, two pairs of stout scissors, and a pair of bone-cutting forceps. A long glass tube, about 5 mm. in bore, into one end of which is fused a stout, hollow platinum needle. This tube is coated with

a mixture of hard and soft paraffin, by being immersed in a deep vessel containing equal parts of paraffin melting at 45° and 58° C. The tube is withdrawn from the molten mixture and quickly drained, care being taken to see that the needle is not choked. The tube is stored till required in a copper vessel, which is cooled by a mixture of ice and salt. Three or four ordinary Pasteur pipettes are coated with paraffin and cooled in the same manner as the needle. Two or three centrifuge tubes are also paraffin-coated and cooled, and a few small test-tubes treated in the same manner. (Fig. 1.)

FIG. 1.



1. Platinum needle fused into glass tube and coated with paraffin, for obtaining blood from heart.
2. Paraffined Pasteur pipette for plasma.
3. Right-angled pipette for saline medium.
4. Paraffined tube for storing plasma.
5. Paraffined centrifuge tube for plasma.
6. Glass capsules for storage of tissues.

The rat is anaesthetised with ether, pinned out, and the thorax opened aseptically. The heart is exposed and steadied with forceps, and the platinum needle plunged into one of the ventricles. The blood is allowed to flow into the tube till the flow slackens, when the tube is withdrawn and the contents are at once run into the centrifuge tubes, which are ice-cold. These are placed in the buckets of a centrifuge and the blood at once centrifuged at high speed for three minutes. The clear supernatant fluid is pipetted off with a cold paraffined Pasteur pipette into a second centrifuge tube, and the plasma again rapidly centrifuged for one minute. With a paraffined pipette some three-quarters of the supernatant fluid is pipetted off into a small paraffined test-tube, which is at once placed in a copper vessel surrounded with ice and salt, where it remains till required. Such a plasma, although it will give limited growth of embryonic tissues for a few generations, is not suitable for continued cultivation, for which the addition of an embryonic extract is necessary.

Embryo Extract.

Young embryos of the rat or mouse are taken at about the twelfth day. The parent is anaesthetised and the abdomen opened with aseptic precautions. The embryos are removed and are placed in a sterile Petri dish and covered with Locke's solution. They are next removed from the membranes and washed in another dish with Locke. They are next cut up with sterile scissors into coarse fragments, and the fragments transferred to several changes of Locke to free them from blood. This is essential, as more than minimal traces of blood inhibit growth. As soon as all obvious traces of blood have been removed, the embryo fragments are placed in a small tumour mincer (Fig. 2) and are finely minced. The pulp is transferred to a sterile tube and an equal volume of Locke's solution added, and the mixture is well shaken. It is then frozen and thawed twice to disintegrate the cells, and centrifuged at high speed for 15 minutes. The clear fluid is pipetted off and constitutes embryo extract. As an additional

* Lectures II. and III. will appear in coming issues of THE LANCET.